06.06.2024

Curriculum at LAB University of Applied Sciences 2024-2025

Bachelor of Engineering, Wood Technology 24S, full-time studies, Lahti

Code	Name	1 y	2 y	3 y	4 y	ECTS total
TLTIPUU24S-1040	**CORE COMPETENCE**					**193**
TLTIPUU24S-1021	**Common studies**					**15**
AY00BU56	Developing professional competence 1	1				1
AY00BU57	Developing professional competence 2		1			1
AY00BU58	Developing professional competence 3			1		1
A300CE13	Orientation to Sustainability Thinking	2				2
KE00BT61	English for Work	4				4
KR00BU42	Swedish for Work, Spoken	1				1
KR00BU43	Swedish for Work, Written	1				1
KS00BT59	Expert Communication Skills	4				4
TLTIPUU24S-1022	**Professional Core Competence**					**133**
TLTIPUU24S-1023	**Basic studies in mathematics and physics**					**15**
AT00BT67	Basic studies in mathematics	3				3
AT00BT68	Mathematics in Technology 1		3			3
AT00BT69	Mathematics in Technology 2		3			3
AT00BT70	Basic studies in physics	3				3
AT00BZ00	Wood technology physics		3			3
TLTIPUU24S-1024	**Basic studies in Wood Engineering**					**13**
AT00BZ02	Forest and Raw Materials	5				5
AT00BZ03	Wood Processing	5				5
AT00CV51	Helth and Safety in Wood Laboratory Environment	3				3
TLTIPUU24S-1025	**Wood material technologies**					**15**
AT00BZ04	Glueing	5				5
AT00BZ05	Surface Treatment	5				5
AT00BZ06	Wood Construction	5				5
TLTIPUU24S-1026	**Digital Tools**					**15**
AT00BV34	Digital Tools	5				5
AT00BZ07	Machine Drawing and 3D Design	5				5
AT00BZ08	CAD/CAM and 3D printing		5			5
TLTIPUU24S-1027	**Sawmill industry**					**15**
AT00BZ09	Sawn timber production and processes		5			5
AT00BZ10	Timber based products		5			5

AT00BZ11	Drying and thermal modification		5			5
TLTIPUU24S-1028 Wood-based Panels Industry						**15**
AT00BZ12	Plywood and LVL technology			5		5
AT00BZ13	Particle board, MDF, OSB and other wood-based panels			5		5
AT00BZ14	R&D Project			5		5
TLTIPUU24S-1029 Furniture Industry						**15**
AT00BZ15	Furniture Industry		5			5
AT00BZ16	Industrial Processes and Production		5			5
AT00BZ17	Product Development Project		5			5
TLTIPUU24S-1030 Business and Economics						**15**
AT00BZ18	Sales and Marketing			5		5
AT00BZ19	Business economics			5		5
AT00BZ20	Research Seminar			5		5
TLTIPUU24S-1031 Production Automation and Management						**15**
AT00CG68	IoT principles in different sectors		5			5
AT00BZ23	Automation and Digitalisation		5			5
AL00CD63	Management and Leadership		5			5
TLTIPUU24S-1038 Practical Training						**30**
HA00CD55	Practical Training					0
HA00BU60	Practical Training 2			10		10
HA00BU61	Practical Training 3				10	10
TLTIPUU24S-1039 Thesis						**15**
AO00BU62	Thesis Planning				5	5
AO00BU63	Thesis Project				5	5
AO00BU64	Thesis Report				5	5
TLTIPUU24S-1032 COMPLEMENTARY COMPETENCE						**47**
AT00CD17	Introduction to Mathematics	3				3
AT00CV47	Wood tecnology chemistry and statistical mathematics	5				5
TLTIPUU24S-1033 Wood product industry						**15**
AT00BZ24	Wood product in building industry			5		5
AT00CU23	Global wood business			5		5
AT00CU24	Wood architecture			5		5
TLTIPUU24S-1034 CNC technology in wood industries						**10**
AT00CZ03	CNC programming		5			5
AT00CT29	CNC project		5			5
TLTIPUU24S-1035 Production economy						**15**
AT00BZ30	LEAN and 5S				5	5
AL00CE39	Logistics and Supply Chain Management				5	5
AT00CT26	Production Management				5	5
TLTIPUU24S-1036 Studio studies						**20**
TLTIPUU24S-1037 Versatile Studies						**0**

AT00CB83	Project Learning in Enterprises					0

TLTIPUU24S-1040 CORE COMPETENCE: 193 ECTS

TLTIPUU24S-1021 Common studies: 15 ECTS

AY00BU56 Developing professional competence 1: 1 ECTS

Learning outcomes
The student is able to
- plan their own learning and cooperate in situations related to their own field of studies
- recognize their own competence and the needs to develop them further and to plan their careerpath observing them
- act as a group member
- operate in the learning environments of LAB University of Applied Sciences
- picture their own field of studies and its future skills- give feedback on tuition and services and thus participate in the development of education

AY00BU57 Developing professional competence 2: 1 ECTS

Learning outcomes
The student is able to
- utilize various learning opportunities in curriculum
- recognize and aim their own competences to be in level with the future career requirements
- create a study plan that supports the future career goal
- give feedback on tuition and services and thus participate in the development of education

AY00BU58 Developing professional competence 3: 1 ECTS

Learning outcomes
The student is able to
- identify themselves as a learner and develop their own learning skills
- evaluate innovative or alternative future competences required in their own field
- recognize and aim their own competences to be in level with the future career requirements
- masters the professional concepts of their own field and is able to point out their competenciesduring job recruitment processes
- give feedback on tuition and services and thus participate in the development of education

A300CE13 Orientation to Sustainability Thinking: 2 ECTS

Learning outcomes
Identify and define central concepts and frameworks related to sustainability. Recognize the interconnectedness of economic, social and environmental sustainability issues. Understand and develop own individual role in driving sustainability.

Evaluation criterias
Level 1

Pass-Fail

KE00BT61 English for Work: 4 ECTS

Learning outcomes
Proficiency level: B2

The student is able to
- communicate clearly and effectively in different generic and field-specific workplace situations both orally and in writing
- find, evaluate and use information effectively
- function collaboratively in international working environments.

KR00BU42 Swedish for Work, Spoken: 1 ECTS

Learning outcomes
The student is able to
- convey and validate arguments
- use vital field-specific vocabulary
- communicate essential matters about their education, work experience and tasks
- present their field-specific operational environment
- communicate in various working life situations in Swedish.

The student completes the Public Administration Language Test in Swedish.

KR00BU43 Swedish for Work, Written: 1 ECTS

Learning outcomes
The student is able to
- use vital field-specific vocabulary
- communicate essential matters about their education, work experience and tasks
- understand and produce various short texts related to studies and working life
- acquire information on their field in Swedish
-use online dictionaries.

The student completes the Public Administration Language Test in Swedish.

KS00BT59 Expert Communication Skills: 4 ECTS

Learning outcomes
Proficiency level: C2

The student masters Finnish language as a mother tongue in all professional spoken and written communication situations.

TLTIPUU24S-1022 Professional Core Competence: 133 ECTS

TLTIPUU24S-1023 Basic studies in mathematics and physics: 15 ECTS

AT00BT67 Basic studies in mathematics: 3 ECTS

Learning outcomes
Student is able to
- calculate and simulate mathematical expressions
- solve geometric and trigonometric problems
- knows bacis of vectors in plane

AT00BT68 Mathematics in Technology 1: 3 ECTS

Learning outcomes
Student is able to:
- recognise different polynomial equations, functions, and polynomial graphics
- solve inequalities
- solve simultaneous equations with the software
- solve basic space vectors
- utilise space vectors
- solve exponential and logarithm functions

AT00BT69 Mathematics in Technology 2: 3 ECTS

Learning outcomes
Student is able to:
- derivate functions and utilise derivation in practice
- integrate polynomial functions and utilise integration in practice
- solve other equations and trigonometrical problems

AT00BT70 Basic studies in physics: 3 ECTS

Learning outcomes
Student is able to
- understand the purpose of the physics in technology
- describe and utilize the SI-unit system and implement
- solve mathematical problems in kinematics, mechanics and thermodynamics
- utilize vectors

AT00BZ00 Wood technology physics: 3 ECTS

Learning outcomes
Student is able to:
- describe the electronic phenomena behind the development of technology
- solve mathematical problems in electrical sciences
- conduct physical measurements and draft a proper report on their findings
- apply digitalisation in the processing of results

TLTIPUU24S-1024 Basic studies in Wood Engineering: 13 ECTS

AT00BZ02 Forest and Raw Materials: 5 ECTS

Learning outcomes
The student is able to:
-basics related to tree growth and harvesting
-evaluate the use of wood as a renewable natural material
-evaluate the ecological impact of wood use
-Describe the basic structure of the tree
-describe the structure of a tree at the cellular level

AT00BZ03 Wood Processing: 5 ECTS

Learning outcomes
Student is able to:
- describe the basics related to woodworking
- discuss woodworking blades and blade materials with the blade supplier
- make choices about woodworking methods with the goal of profitable business and high-quality woodworking results
- describe the machines and equipment used for woodworking
- select suitable woodworking methods for the various stages of manufacturing a product

AT00CV51 Helth and Safety in Wood Laboratory Environment: 3 ECTS

Learning outcomes
The student is able to:
- use laboratory machines in accordance with safety regulations
- operate in accordance with the organisation's safety instructions in the laboratory facilities
- describe issues related to occupational safety about the safety and health of the working environment
- search for and use safety data sheets for harmful and dangerous substances
- describe the principles of occupational safety and health in the workplace

TLTIPUU24S-1025 Wood material technologies: 15 ECTS

AT00BZ04 Glueing: 5 ECTS

Learning outcomes
The student is able to:
- describe the basic phenomena (chemistry) affecting wood gluing
- define the factors influencing gluing
- compare the properties of the most common wood glues
- choose a suitable adhesive for different applications

AT00BZ05 Surface Treatment: 5 ECTS

Learning outcomes
The student is able to:
- describe basic phenomena related to wood surface treatment (chemistry)
- pre-treat the wood surface
- compare the properties of surface treatment agents and application and drying methods
- taking into account environmental and occupational safety aspects
- use film coating methods

AT00BZ06 Wood Construction: 5 ECTS

Learning outcomes
Student is able to:
-describe the structure of wood at the level of cell wall
-describe specific features of the interaction between wood and moisture
-describe how the structure of wood affects its properties
-take special characteristics of the wood into consideration in its various uses
-manage the basics of the manufacturing processes of the most common wood products

TLTIPUU24S-1026 Digital Tools: 15 ECTS

AT00BV34 Digital Tools: 5 ECTS

Learning outcomes
Student is able to
- work in a virtual learning environment
- make reports and analyses with the help of wordprocessing and spreadheet calculation software
- use correct cloud environment individually and in a group
- carry out digital project presentation

AT00BZ07 Machine Drawing and 3D Design: 5 ECTS

Learning outcomes
The student is able to:
- basics of technical drawing
- Basics of CAD drawing
- read, edit and create technical 2D drawings
- Basics of 3D modeling
- create technical drawings in a 3D environment and visualize 3D assemblies

AT00BZ08 CAD/CAM and 3D printing: 5 ECTS

Learning outcomes
The student is able to:
- Key concepts and features of CNC technology
- Basics of CAD / CAM technology
- create CNC toolpaths using CAM software
- machine the planned toolpath with a CNC milling machine
- model the plan as a 3D model and print the model on a 3D printer.

TLTIPUU24S-1027 Sawmill industry: 15 ECTS

AT00BZ09 Sawn timber production and processes: 5 ECTS

Learning outcomes
The student is able to:

- basics of the sawmill industry, Finnish forests and forestry
- basics of wood raw material and wood raw material procurement
- forest Certification in business (PEFC & FSC)
- sawn timber manufacturing: the production planning process
- sawing process and machinery
- further developed products, substitutes and competitors
- sales and marketing of wood products
- logistics and incoterms clauses
- R&D - development of wood products over the years
- use of wood in construction.

AT00BZ10 Timber based products: 5 ECTS

Learning outcomes
The student is able to:
- recognises most important timber based building products
- recognises most importat timber based interior products
- understands the principles of timber based products' design and planning, use, installation and maintenance
- see the differences in timber based products' use in different geographic and cultural areas

AT00BZ11 Drying and thermal modification: 5 ECTS

Learning outcomes
The student is able to:
- basics of wood drying
- Industrial wood drying and its processes
- firewood and its manufacturing process
- basic wood drying invoices
- targets for wood drying in different applications
- other methods of drying wood, drying defects

TLTIPUU24S-1028 Wood-based Panels Industry: 15 ECTS

AT00BZ12 Plywood and LVL technology: 5 ECTS

Learning outcomes
The student is able to:
- describe the manufacturing processes of plywood and LVL board products
- know the main end uses of both board type
- define the technical properties of both board types
- know the further processing possibilities of both board types
- produce plywood in laboratory environment and make standard quality tests

AT00BZ13 Particle board, MDF, OSB and other wood-based panels: 5 ECTS

Learning outcomes
The student is able to:

- describe the manufacturing processes of particleboard, MDF and OSB board products
- know the main end uses of each board type
- define the technical properties of different board types
- know the further processing possibilities of different board types
- produce particleboard in laboratory environment and make standard quality tests

AT00BZ14 R&D Project: 5 ECTS

Learning outcomes
The student is able to:
- make a project plan including time schedule, responsibilities and target setting
- learn customer communication
- search for professional literature to support the project
- report on the project results and analyse them
- make seminar presentation to customer

TLTIPUU24S-1029 Furniture Industry: 15 ECTS

AT00BZ15 Furniture Industry: 5 ECTS

Learning outcomes
Student is able to:
- describe the operating environment of the furniture industry
- evaluate the operational strategies of companies in the sector
- describe products and their production methods in the furniture industry
- name Finnish furniture designers and their products
- analyze the Finnish furniture industry and its future

AT00BZ16 Industrial Processes and Production: 5 ECTS

Learning outcomes
Student is able to:
- name the various production processes of the furniture industry
- describe production planning and control methods
- discuss the importance of different factors of production as part of layout design
- describe the principles of lean thinking and activities
- describe the principles of investment accounting and its significance for the company's profitability

AT00BZ17 Product Development Project: 5 ECTS

Learning outcomes
Student is able to:
- use brainstorming tools when designing the product development project
- utilise the product design process in his/her own project work
- use technical drawing tools in designing the product
- combine design and technical design
- work in a group and bring his/her expertise to the benefit of the design team

TLTIPUU24S-1030 Business and Economics: 15 ECTS

AT00BZ18 Sales and Marketing: 5 ECTS

Learning outcomes
The student is able to:
- basic concepts of sales and marketing
- understands the differences between B2B and B2C
- understands the concept of branding
- basics of advertising
- the importance of logistics to businesses

AT00BZ19 Business economics: 5 ECTS

Learning outcomes
The student is able to:
- understand the basics of business mathematics
- price a product and understand the effects of different factors on price formation
- understand the importance of business economics for the success of a company
- assess a company's profitability, solvency and productivity in the light of key indicators

AT00BZ20 Research Seminar: 5 ECTS

Learning outcomes
Student is able to:
- acquire and utilise research-related information and use sources appropriately
- follow ethical principles in research activities
- use the most typical research and development methods in his/her field
- write a scientific report with appropriate language, style and referencing

TLTIPUU24S-1031 Production Automation and Management: 15 ECTS

AT00CG68 IoT principles in different sectors: 5 ECTS

Learning outcomes
Student is able to
- descripe a structure of the IoT-system
- knowledge basics of sensors and data collection in IoT systems
- compare IoT cloud environments
- descripe requirements for IoT mobile software
- use IoT in business

AT00BZ23 Automation and Digitalisation: 5 ECTS

Learning outcomes
The student is able to:
- definition of automatic production machine or line
- production recipe and recipe processing for automation

- automatic product change on the production line
- benefits and requirements of automation
- the opportunities for digitalisation now and in the future

AL00CD63 Management and Leadership: 5 ECTS

Learning outcomes
Students knows:
- key management & leadership models and methods.
- the characteristics of modern management & leadership and the importance of the organization of the work community.
- the diverse field of responsibilities of managers and their own role in it.
- basics of labor law

TLTIPUU24S-1038 Practical Training: 30 ECTS

HA00CD55 Practical Training: 10 ECTS

Learning outcomes
The student is able to
- describe work-related phenomena and use related concepts
- act in a productive way, following the practices of the workplace and the ethical principles of the profession
- use the techniques, work methods, models and processes that they have learnt
- act in a customer-oriented way in interactive situations in the workplace and in the cooperation network
- evaluate and develop their own competence int the work done in practical training

HA00BU60 Practical Training 2: 10 ECTS

Learning outcomes
The student is able to
- describe work-related phenomena and use related concepts
- act in a productive way, following the practices of the workplace and the ethical principles of the profession
- use the techniques, work methods, models and processes that they have learnt
- act in a customer-oriented way in interactive situations in the workplace and in the cooperation network
- evaluate and develop their own competence int the work done in practical training

HA00BU61 Practical Training 3: 10 ECTS

Learning outcomes
The student is able to
- describe work-related phenomena and use related concepts
- act in a productive way, following the practices of the workplace and the ethical principles of the profession
- use the techniques, work methods, models and processes that they have learnt
- act in a customer-oriented way in interactive situations in the workplace and in the cooperation network
- evaluate and develop their own competence int the work done in practical training

TLTIPUU24S-1039 Thesis: 15 ECTS

AO00BU62 Thesis Planning: 5 ECTS

Learning outcomes
The student is able to:
- describe the objectives and core contents of their thesis
- plan and describe the stages of the thesis process
- take into account the possible research permit and copyright issues

AO00BU63 Thesis Project: 5 ECTS

Learning outcomes
The student is able to:
- implement the thesis on the basis of an approved thesis plan.

AO00BU64 Thesis Report: 5 ECTS

Learning outcomes
The student is able to:
- present the results or output of their thesis
- report on their thesis in writing in accordance with the thesis guidelines of LAB University of Applied Sciences
- write a maturity test.

TLTIPUU24S-1032 COMPLEMENTARY COMPETENCE: 47 ECTS

AT00CD17 Introduction to Mathematics: 3 ECTS

AT00CV47 Wood tecnology chemistry and statistical mathematics: 5 ECTS

Learning outcomes
Student is able to
Chemistry
- basics of organic chemistry
- basics of the chemical composition of wood
Statistical mathematics
- basics of probability calculation and statistical mathematics and knows the most common probability distributions
- utilize statistical methods in data analysis and determining causality
- apply statistical methods in tasks related to their own field

TLTIPUU24S-1033 Wood product industry: 15 ECTS

AT00BZ24 Wood product in building industry: 5 ECTS

Learning outcomes
The student is able to:
- know the possibilities and limitations of LVL for building industry
- know the possibilities and limitations of plywood for building industry
- know the possibilities and limitations of CLT for building industry
- know the possibilities and limitations of gluelam for building industry
- overview of other Wood Products used in construction
- describe key production equipment and functions for different applications

AT00CU23 Global wood business: 5 ECTS

Learning outcomes
Student understands
- the global nature of modern wood products business.
- the combination of local nature of production through raw materials against varying demands in different parts of the globe
- competitive product and service offerings
- logistic options and challenges
- future trends and possibilities for the industry

AT00CU24 Wood architecture: 5 ECTS

Learning outcomes
The student is able to:
- history of wood in architecture
- regional differences
- future vision for use of wood and other natural material in architecture

TLTIPUU24S-1034 CNC technology in wood industries: 10 ECTS

AT00CZ03 CNC programming: 5 ECTS

Learning outcomes
The student is able to:
- define and utilize automated workflows and macros
- leverage 3D graphics
- use and exploit global variables
- perform DXF and 3D-Solid imports
- create parameter constraints and equations
- generate parametric CNC programs

AT00CT29 CNC project: 5 ECTS

Learning outcomes
The student is able to:
- make a project plan including time schedule, responsibilities and target setting
- make 3D design of a product
- make CNC programming for selected product
- manufacture the product with CNC machine

- make project report and seminar presentation

TLTIPUU24S-1035 Production economy: 15 ECTS

AT00BZ30 LEAN and 5S: 5 ECTS

Learning outcomes
The student is able to:
- know LEAN and 5S principles
- define how to use LEAN and 5S in production management
- define production line information collection typically related to LEAN and 5S
- know LEAN and 5S tools
- know improvement possibilities in production line by LEAN and 5S

AL00CE39 Logistics and Supply Chain Management: 5 ECTS

Learning outcomes
Student is able to

-use basic concepts of logistics and supply chain management.
- the principles of value chain formation.
- identify the impact of logistics and supply chains on the company's profitability and competitiveness.
- describe the importance of customer orientation and stakeholder cooperation throughout the supply chain.

AT00CT26 Production Management: 5 ECTS

Learning outcomes
The student is able to:
- define key concepts and development methods related to production and production strategy
- development of production strategy and methods
- development of production infrastructure
- development a supply chain strategy

TLTIPUU24S-1036 Studio studies: 20 ECTS

TLTIPUU24S-1037 Versatile Studies: 0 ECTS

AT00CB83 Project Learning in Enterprises: 15 ECTS

Learning outcomes
Student is able to
- use professional competencies in expert and supervising duties
- document and report personal professional development